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REMARKS

This Amendment is responsive to the Final Office Action mailed May 28, 2002 in which claims 1, 2, 5-14 and 16-20 were rejected, and claims 3, 4, 15 and 21 were objected to. With this Response, claims 1-4, 7, 9, 10, 13-16 and 18-21 have been amended. Claims 1-21 remain pending in the application and are presented for reconsideration and allowance.

Claim Rejections under 35 U.S.C. § 112

Claims 1-8 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. In particular, claim 1 was rejected because it was said to be unclear if the control device was different from the ink extraction determining device. In response, claim 1 has been amended to eliminate the confusion. In light of these changes, Applicants believe that the rejection of the claims under 35 U.S.C. § 112, second paragraph, has been overcome and should be withdrawn. Such action is respectfully requested.

Claim Rejections under 35 U.S.C. § 102

Claims 1, 2, 5-14 and 16-20 were rejected under 35 U.S.C. § 102(e) as being anticipated by the U.S. Patent 6,155,664 to Cook. Cook in figure 1 is said to disclose an inkjet printing system configured for receiving a replaceable ink container 2. The replaceable ink container 2 is said to have ink extraction characteristics that vary with ink extraction. The inkjet printing system is said to include an ink extraction determining device (monitoring device) 36 for determining ink extracted from the ink container (90, 94), and a control device 36 that selects a print mode from a plurality of print modes (print primary ink vs. secondary ink, Fig. 4) based on ink extraction characteristics of the ink container 90. The Examiner also detailed how Cook anticipates what is claimed in dependent claims 2, 5-8, 12 and 13.

Independent claim 1 has been amended and is now directed to an inkjet printing system configured for receiving a replaceable ink container having ink extraction characteristics that vary with ink extraction. The inkjet printing system comprises an ink extraction control device for determining ink extracted from the replaceable ink container,

and for selecting an ink usage rate print mode from a plurality of different ink usage rate print modes based on ink extraction characteristics of the replaceable ink container.

By adjusting the ink usage rate print mode based upon ink extraction characteristics, ink can be more fully extracted from the replaceable ink container while preventing ink starvation during printing. Because more ink is extracted from the ink container, the ink container does not need to be replaced as often, thereby reducing the per page printing costs of the printing system and reducing waste. An inkjet printing system of this type is not taught, disclosed or anticipated by Cook.

Cook in figure 1 is directed to an inkjet printing system that includes an inkjet printhead cartridge 2 having a printhead 24. The printhead cartridge 2 includes an integral primary ink reservoir 4 containing a first quantity of ink that is supplied to the printhead 24. The inkjet printing system further includes a remote ink cartridge 8 having a secondary ink reservoir 10 containing a second quantity of ink. The secondary ink reservoir 10 of the remote ink cartridge 8 is connected to the primary ink reservoir 4 of the inkjet printhead cartridge 2 via supply lines 6, 7 through a flow control device 1 (described with reference numeral 5 in the Cook specification). The printhead cartridge 2 and the remote ink cartridge 8 include memory devices 12 and 14 respectively, which are connected with the flow control device 1 to a controller 36 of the printing system. The controller 36 through ink drop count information from the memory devices 12, 14, or from ink level sensors 28a-28e, 30a-30b, determines the amount of ink in the primary and secondary reservoirs 4, 10 to determine when to open the flow control device 1 to refill the primary reservoir 4 from the secondary reservoir 10. If the ink level in the primary reservoir 4 is below a certain minimum threshold then the reservoir 4 is refilled from the reservoir 10. If the secondary reservoir 10 does not have enough ink to refill the primary reservoir 4 then the printing system is shut down and the user is notified.

As is clear from a review of Cook, Cook does not disclose, teach or anticipate what is now claimed in amended independent claim 1. In particular, Cook does not anticipate an inkjet printing system configured for receiving a replaceable ink container having ink extraction characteristics that vary with ink extraction, with the printing system comprising an ink extraction control device for determining ink extracted from the replaceable ink container, and for selecting an ink usage rate print mode from a plurality of different

ink usage rate print modes based on ink extraction characteristics of the replaceable ink container. In Cook, refilling the primary reservoir 4 from the secondary reservoir 10 does not require the controller 36 to select an ink usage rate print mode from a plurality of different ink usage rate print modes based on ink extraction characteristics of the replaceable ink container, as set forth in amended independent claim 1. In Cook, there is only a single ink usage rate print mode. In other words, whether printing from the primary ink reservoir 4 of the printhead cartridge 2 uses ink in the primary ink reservoir 4 or ink used to refill the primary ink reservoir 4 from the secondary ink reservoir 10, the printhead cartridge uses the same ink usage rate. As such, Cook does not disclose, teach, suggest or anticipate, as now set forth in amended independent claim 1, an ink extraction control device for selecting an ink usage rate print mode from a plurality of different ink usage rate print modes based on ink extraction characteristics of the replaceable ink container. In Cook, the controller 36 simply determines when to refill the primary reservoir 4 from the secondary reservoir 10. In regards to Examiner's arguments in the instant office action related to independent claim 1, these remarks are believed to be addressed by Applicants' above remarks.

By adjusting the ink usage rate print mode based upon ink extraction characteristics, ink can be more fully extracted from the replaceable ink container while preventing ink starvation during printing. Because more ink is extracted from the ink container, the ink container does not need to be replaced as often, thereby reducing the per page printing costs of the printing system and reducing waste.

For the reasons set forth above, Applicants believe that Cook does not disclose, teach or anticipate, either implicitly or explicitly, what is now claimed by Applicants in amended independent claim 1. Hence, Applicants believe that the rejection of independent claim 1 under 35 U.S.C. § 102(e) has been overcome and should be withdrawn. Such action is respectfully requested.

Claim 9 has been amended and is now directed to an inkjet printing system having a printhead responsive to control signals for depositing ink on media and an ink delivery system for delivering ink to the printhead. The inkjet printing system comprises a monitoring and control device for monitoring ink delivered to the printhead by the ink delivery system,

and for adjusting rate of ink extraction from the ink delivery system during a print operation based on ink deposited on media and ink delivered to the printhead.

Quite simply, Cook does not teach, disclose or anticipate an inkjet printing system that includes a monitoring and control device for monitoring ink delivered to the printhead by the ink delivery system, and for adjusting rate of ink extraction from the ink delivery system during a print operation based on ink deposited on media and ink delivered to the printhead, as now set forth in amended independent claim 9. In Cook, as stated above in connection with amended independent claim 1, the rate of ink extraction, whether using ink from the primary ink reservoir 4 of the printhead cartridge 2 or ink used to refill the primary ink reservoir 4 from the secondary ink reservoir 10, never changes. As such, Cook cannot disclose, teach, suggest or anticipate, as now set forth in amended independent claim 9, a monitoring and control device for adjusting rate of ink extraction from the ink delivery system during a print operation based on ink deposited on media and ink delivered to the printhead. In regards to Examiner's arguments in the instant office action related to independent claim 9, these remarks are believed to be addressed by Applicants' above remarks.

Therefore, for the reasons set forth above, Applicants believe that Cook does not disclose, teach or anticipate, either implicitly or explicitly, what is now claimed by Applicants in amended independent claim 9. Hence, Applicants believe that the rejection of independent claim 9 under 35 U.S.C. § 102(e) has been overcome and should be withdrawn. Such action is respectfully requested.

Independent claim 16 has been amended to include language similar to that added to amended independent claim 9. As such, the arguments above directed to amended independent claim 9 are equally applicable to amended independent claim 16.

Therefore, for the reasons set forth above, Applicants believe that Cook does not disclose, teach or anticipate, either implicitly or explicitly, what is now claimed by Applicants in amended independent claim 16. Hence, Applicants believe that the rejection of independent claim 16 under 35 U.S.C. § 102(e) has been overcome and should be withdrawn. Such action is respectfully requested.

Dependent claims 2-8, 10-15 and 17-21 are directly or indirectly dependent upon amended independent claims 1, 9 and 16. As discussed above, it is believed that independent

Applicant: Rory A. Heim et al.

Serial No.: 09/851,765

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Docket No.: 10006454-1

Title: METHOD AND APPARATUS FOR COMPENSATION FOR INK CONTAINER EXTRACTION CHARACTERISTICS

claims 1, 9 and 16 are now in a condition for allowance. Therefore, consideration and allowance of dependent claims 2-8, 10-15 and 17-21 is also requested.

CONCLUSION

In conclusion, it is believed that all claims 1-21 of this application are now in condition for allowance. A notice to that effect is respectfully requested.

Attached hereto is a marked-up version of the changes made to the specification and/or the claims by the current Amendment. The attached pages are captioned "**VERSION WITH MARKINGS TO SHOW CHANGES MADE**".

Amendment and Response 37 C.F.R. 1.116

Applicant: Rory A. Heim et.al.

Serial No.: 09/851,765

Filed: May 9, 2001

Docket No.: 10006454-1

Title: METHOD AND APPARATUS FOR COMPENSATION FOR INK CONTAINER EXTRACTION CHARACTERISTICS

Any inquiry regarding this Amendment and Response should be directed to Kevin B. Sullivan at Telephone No. (858) 655-5228, Facsimile No. (858) 655-5859. In addition, all correspondence should continue to be directed to the following address:

Hewlett-Packard Company
Intellectual Property Administration
P.O. Box 272400
3404 E. Harmony Road, M/S 35
Fort Collins, Colorado 80527-2400

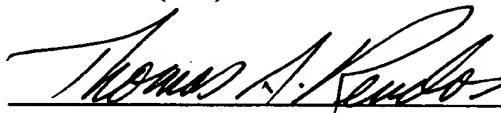
Respectfully submitted,

Rory A. Heim et al.,

By their attorneys,

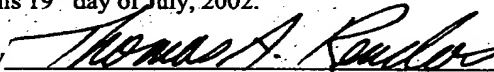
DICKE, BILLIG & CZAJA, P.A.
701 Building, Suite 1250
701 Fourth Avenue South
Minneapolis, MN 55415
Telephone: (612) 573-2009
Facsimile: (612) 573-2005

Date: 7-19-02
TAR:cmj


Thomas A. Rendos
Reg. No. 33,349

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By 
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Rory A. Heim et al.

Examiner: Michael P. Nghiem

Serial No.: 09/851,765

**VERSION WITH MARKINGS
TO SHOW CHANGES MADE**

Group Art Unit: 2861

Filed: May 9, 2001

Docket No.: 10006454-1

Title: METHOD AND APPARATUS FOR COMPENSATING FOR INK
CONTAINER EXTRACTION CHARACTERISTICS

AMENDMENT AND RESPONSE UNDER 37 C.F.R. 1.116

Box AF

Commissioner for Patents
Washington, D.C. 20231

Dear Sir/Madam:

This Amendment is responsive to the Final Office Action mailed May 28, 2002.

Please amend the above-identified patent application as follows:

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IN THE CLAIMS

Please amend claims 1-4, 7, 9, 10, 13-16 and 18-21 as follows:

1. (Twice Amended) An inkjet printing system configured for receiving a replaceable ink container, the replaceable ink container having ink extraction characteristics that vary with ink extraction, the inkjet printing system comprising:

an ink extraction ~~determining~~ control device for determining ink extracted from the replaceable ink container; ~~and a control device and~~ for selecting a an ink usage rate print mode from a plurality of different ink usage rate print modes based on ink extraction characteristics of the replaceable ink container.

2. (Amended) The inkjet printing system of claim 1, wherein the ink extraction control device selects the ink usage rate print mode for selectively pausing printing to reduce an average ink usage rate.

3. (Twice Amended) An ~~The~~ inkjet printing system ~~of claim 1~~ configured for receiving a replaceable ink container, the replaceable ink container having ink extraction characteristics that vary with ink extraction, the inkjet printing system comprising:

an ink extraction control device for determining ink extracted from the replaceable ink container and for selecting a print mode from a plurality of different print modes based on ink extraction characteristics of the replaceable ink container, wherein each print mode of the plurality of different print modes has a different pause value associated therewith.

4. (Twice Amended) The inkjet printing system of claim 1 wherein the plurality of different ink usage rate print modes includes at least a first printing mode with a first ink usage rate and at least a second printing mode with a second ink usage rate different from the first ink usage rate.

5. The inkjet printing system of claim 1 wherein the replaceable ink container has ink extraction characteristics that vary with the ink level within the replaceable ink container.

6. The inkjet printing system of claim 1 wherein the replaceable ink container has a gauge pressure characteristic based on ink usage which varies with ink level within the ink container.

7. (Twice Amended) The inkjet printing system of claim 1 wherein ink extraction characteristics are stored on an electrical storage device associated with the replaceable ink container, ~~wherein the electrical storage device defines the ink extraction determining device,~~ and wherein the ink extraction characteristics are provided to the control device after installation of the replaceable ink container into the inkjet printing system.

8. The inkjet printing system of claim 7 wherein the information storage device is a semiconductor storage device.

9. (Twice Amended) An inkjet printing system having a printhead responsive to control signals for depositing ink on media and an ink delivery system for delivering ink to the printhead, the inkjet printing system comprising:

a monitoring and control device for monitoring ink delivered to the printhead by the ink delivery system, and for adjusting ~~print~~ rate of ink extraction from the ink delivery system during a print operation based on ink deposited on media and ink delivered to the printhead.

10. (Twice Amended) The inkjet printing system of claim 9 wherein the monitoring and control device adjusts ~~print~~ rate of ink extraction from the ink delivery system based on a rate of ink deposited on media and a rate of ink delivered to the printhead.

11. The inkjet printing system of claim 9 wherein the monitoring and control device determines ink delivered to the printhead based on ink extraction characteristics of an ink container.

12. The inkjet printing system of claim 11 wherein the monitoring and control device determines an amount of ink delivered to the printhead over a given time interval based on an extraction rate for an ink container that is determined based on ink remaining in the ink container.

13. (Twice Amended) The inkjet printing system of claim 9 wherein the monitoring and control device adjusts ~~print~~ rate of ink extraction from the ink delivery system to prevent the ~~print~~ rate of ink extraction from the ink delivery system from exceeding a rate of ink ~~delivered to~~ ejected from the printhead by more than a threshold value.

14. (Twice Amended) The inkjet printing system of claim 9 wherein the monitoring and control device adjusts ~~print~~ rate of ink extraction from the ink delivery system by selectively pausing printing to reduce an average ~~print~~ rate of ink extraction from the ink delivery system.

15. (Twice Amended) The inkjet printing system of claim 9 wherein the monitoring and control device adjusts ~~print~~ rate of ink extraction from the ink delivery system by selectively controlling numbers of nozzles activated.

16. (Twice Amended) A method for operating a printing system having a printhead and a supply of ink separate from the printhead, the method comprising:
- determining ink flow from the printhead;
 - determining ink flow into the printhead; and
 - adjusting a ~~print~~ rate of ink extraction from the supply of ink during a print operation if the ink flow from the printhead exceeds ink flow into the printhead by a threshold amount.
17. The method claim 16 wherein the determining ink flow from the printhead is based on drop counting.
18. (Amended) The method of claim 16 wherein the determining ink flow into the printhead is based on ink extraction characteristics of the supply of ink ~~container~~.
19. (Twice Amended) The method of claim 18 wherein the determining ink flow into the printhead is based on ink level within the supply of ink ~~container~~.
20. (Amended) The method of claim 16 wherein the adjusting the ~~print~~ rate of ink extraction from the supply of ink is selectively inserting a pause between successive print swaths to reduce an average ~~print~~ rate of ink extraction from the supply of ink for successive print swaths.
21. (Amended) The method of claim 16 wherein the adjusting the ~~print~~ rate of ink extraction from the supply of ink is selectively limiting the number of nozzles activated on the printhead.